

## **5.0 ACCIDENT ANALYSIS**

### **5.1 The Proposed Action**

The Proposed Action to install and operate two approximately 20-MW simple-cycle gas-fired CTGs at TA-3 consists primarily of activities that are performed on a routine basis in the utility industry. Without the presence of radiological materials or significant quantities of hazardous chemicals, the Proposed Action can be considered common practice in a standard industry. The only known exception would be site environmental restoration involving the cleanup of any contaminants from PRSs, where the potential exists for exposure to very low levels of chemicals resulting from an accident. This activity could be considered a specialized accident type that is somewhat unique to DOE nuclear facilities; however, with knowledge of PRS locations and the nature and extent of contaminants at this PRS, cleanup of the PRS, if needed, before implementation of the Proposed Action is sufficient mitigation to eliminate any credible possibility of a related accident. Section 2.1.1 discusses how known or potential PRSs located within the project area would be managed.

CTGs are self-contained and inherently safe. Gas turbines require no chemicals for water treatment, chemicals that personnel are potentially exposed to in accident conditions. No steam is used to operate the gas turbine. Exhaust gases from the gas turbine turn the turbine blades generating electrical power. Risks from containment systems are absent and preventative maintenance and repair has been very safe. Anoxic conditions that can occur in confined-space work are absent with gas turbines. Combustion blowers are not needed on gas turbines, eliminating the risk of injury in maintaining and repairing them. Gas turbines that catastrophically fail shut down with little or no external damage because of the armor surrounding the turbine blades. Lastly, replacement of gas turbine engines is a comparably simple task with little risk of potential injury. (Jordan 2002).

No safety-significant or safety class systems, structures, or components are associated with the new facilities of the Proposed Action (Merrick 2001). The existing steam turbine generator system has been operated free of serious accidents since 1977 (Gonzales 2002).

### **5.2 Construction (Demolition) Hazards**

The most common hazards associated with the construction of utilities of this type are falls, heavy equipment hazards, being struck or caught by objects or equipment, and transportation incidents. The most serious result of an accident associated with the Proposed Action would be a fatality during construction or operation of the CTGs. "Construction" as discussed here includes demolition and removal of any existing structures; e.g., the cooling towers. Potential fatalities can be considered by comparing national statistics on construction with project worker information for the Proposed Action. Although the low worker numbers and relatively short construction duration period result in the conclusion that no fatalities are likely to result from the proposed construction, we should note that construction laborers are identified as an occupation at high risk of a fatal work injury.

The estimated number of workers was used to compare to recent risk rates of occupational fatalities for construction. Up to 20 full-time workers could be employed for as long as one year. The average fatality rate in the U.S. for industries that include causes of falls, exposure to harmful substances, fires and explosions; being struck by objects, equipment, or projectiles; and transportation (industry-related) is 3.9 per 100,000 workers per year (Saltzman 2001). Based on this statistic and the estimated worker number and duration information, no deaths (0.0008) from these causes are expected from implementing the Proposed Action.

The Proposed Action would require the installation of approximately 400 ft (20 m) of natural gas line that would be tied into an existing service line. Potential accidents that begin with the rupture of pipelines are commonly considered. With an industry pipeline rupture rate of 1.25 per 1,000 miles of pipeline per year (AICE 1994), the increment in pipeline rupture rate associated with the Proposed Action would be negligible ( $\sim 8.2 \times 10^{-5}$  per year).

Under the No Action Alternative, there would be no construction (including demolition) nor installation and, therefore, there is a slightly increased accident risk associated with the Proposed Action when compared with the No Action Alternative.

### **5.3 Operations Hazards**

Hazards often associated with the operation of utilities of this type are electrocution, fires, and pressure-related incidents, including explosions. In the year 2000, the electric services industry experienced 28 fatalities out of a total of 5,915 in the U.S. (DOL 2002), which did not result in classification of occupations in this industry as high risk. Statistics are not available on the specific occupation of operating CTGs, therefore, the proportion of the fatality rate cited above that is associated with operating CTGs is not known. As discussed above, CTGs are inherently safe. Regarding nonfatal injuries and illnesses, in the year 2000, the electric services industry experienced a total of 2.3 injuries involving days away from work and days of restricted work activity per 100 full-time workers; however, the proportion of the rate associated specifically with accidents as opposed to occupational health factors was not specified (DOL 2002). With two full-time employees required to maintain the CTGs (or three employees for the combined-cycle cogeneration CTGs), no fatalities and minimal illness and injury as associated with potential accidents are expected from the operation and maintenance of the CTGs.